

REMARKS

Claims 1-15 are currently active.

The Examiner has rejected Claims 2, 3 and 9 as being unpatentable over Liotta in view of Trumble and Hutchins. Applicant respectfully traverses this rejection.

Referring to Liotta, there is disclosed an implantable mechanical system for assisting blood circulation. Liotta teaches a biomechanical coupling 1 used between the muscle 15 tendon and the mechanical system. A linear pull force of a skeletal muscle 15 is used as a power source for a permanent implantation of a blood pump a. See column 4, lines 60-66. The lever system 23 operates the pump. A blood chamber which, provided with to compressing plates, is comprised by the pump by the 11 having ports 11' connected to the heart by conduits. The blood pumping system is formed by the driving lever system 23, which by two metal straps or flexible straps 24 connect a hydraulic piston into the blood chamber of the pump. The system converts hydraulic force into mechanical force, while the mentioned hydraulic piston of the pump is powered by a hydraulic force generated by an outer power system 31 formed of a piston slidingly contained into the extracorporeal hydraulic cylinder. See column 5, line 49-column 6, line 4.

Referring to Trumble, also the present inventor, there is disclosed a muscle energy converter that teaches it is desirable to attach a muscle energy converter to the tendon to provide a stable long-lasting physical connection.

Referring to Hutchins, there is disclosed a magnetically driven cardiac-assist pump system. Hutchins teaches a magnetically-coupled pumping device 10 having a body-implantable pump 12 and the pump driving unit 14. Pump 12 is connected by a tube 16 to a body-implanted heart-assist device 20. Device 20 typically includes a flow chamber defined by a tubular housing 26, and an elongate inflatable balloon. The balloon communicates via tube 16 with pump 12, whereby a fluid, such as air, may be alternately and recurrently transferred from the pump to the balloon, thus to pump blood through the assisted role device chamber. Pump 12 comprises a bellows 27 having opposed front and rear sides, or walls, 28, 30, and an expandable pleated tube 32 joined at opposite ends to, and extending between such walls. Walls 28, 30 and tube 32 define a fluid-tight pumping chamber 34 having an inlet/outlet port 36 extending rearwardly therefrom. Bellows 27 is housed within a cylindrical enclosure 38 having a tubular wall 40 joined at opposite ends to front and rear walls 42, 44, respectively. Enclosure 38 is made of material allowing magnetic coupling therethrough. Bellows is held within enclosure 38 by securing its rear wall 30 to the enclosure's rear wall 44. Bellows front wall 28 is relatively movable within enclosure 38 between what will be referred to as compressed and expand positions, wherein pleated tube 32 is relatively

compressed and expanded, respectively. As Wall 28 is moved toward rear wall 30, the volume of chamber 34 decreases-tending to force fluid within chamber 34 out through port 36. As wall 28 is moved away from wall 30, the volume of chamber 34 increases-tending to draw fluid into chamber 34 through port 36. Wall 28 thus defines a movable wall portion, movements of which effect changes in the volume of the pumping chamber. Pump 12 further includes a magnetic driving means, drivingly connected to wall 28 for moving the same. System 49 includes a pair of cylindrical rotary driven members 50, 51 suitably rotatably mounted with an enclosure 38 to bearings 52, 54, respectfully. See column 2, line 35-column 3, line 15.

In operation, the driving unit 14 is placed with cap 71a against the outside of the body, such that the pump's rotary driven members confront one another. As the driving unit motor is operated, counter rotating driving members 74, 75 effect, by magnetic coupling across the body surface, counter rotation of rotary driven members 50, 51. Because a substantially equal and opposite torque is applied to each of members 50, 51 by members 74, 75 there is little or no net torque applied to pump 12 during operation. Thus, the tendency of pump 12 to become dislodged is minimized. See column 4, lines 40-60.

The Examiner has come to a position that the teachings of Liotta in combination with Trumble and Hutchins arrive at Claim 2 of applicant. However, in order for the

teachings of different references to be combined, there must be some teaching or suggestion in the references themselves to combine the teachings. Here, there is none. Liotta specifically teaches a bladder 12 that is apart from the pump 11. This is easily seen in figure 1. The Examiner, in the Office Action, states that the bladder type mechanism within the casing holds fluid (is best illustrated in figure 6a) and is respectfully traversed. This goes against the very teachings of Liotta where the bladder 12 is outside the casing. It is not clear what goes on inside the casing except that it appears simply that blood that enters through port 11' is somehow ejected through the other port 11' by the action of the lever system 23, as taught in column 5, lines 60 and 61. The only teaching that applicant can find in regard to the bladder is in column 6, lines 19 through 24 which states that, further, as may be understood, in the assembly disclosed there are other components and auxiliary elements such as, for example, the compensating bladder 12 sub assembly, . . .

Trumble teaches a muscle energy converter that is based on the actions of magnets to control the movement of the piston shaft 84 that simply moves up and down under the action of a muscle which directly pumps a fluid. There is no teaching or suggestion in Trumble to suture the tendon in the context of attaching the arm mechanism to a tendon. Liotta does not teach to do that and Trumble certainly does not teach to modify Liotta to do that. This is because Trumble teaches to suture the attendant to the arm mechanism does not mean that it teaches to do the same in the context of the system taught by Liotta.

Hutchins teaches a bellows, which is inside the casing that is powered by a magnetic pumping system. Just because Hutchins teaches a bellows does not mean it teaches to modify the system of Liotta so the bellows can be placed in a casing where there is no need for one, and where the bladder 12 is actually taught to be outside the casing. Accordingly, there is no teaching or suggestion in these references that the examiner has cited to combine the teachings the Examiner relies on to arrive at applicant's invention of Claim 1.

Furthermore, the teachings in a reference cannot be taken out of the context in which they are found. In other words, the references as a whole must be applied with the teachings, to arrive at applicant's claimed invention. As explained above, the context of Liotta is a bladder that is outside a casing, where the blood is pumped by a lever system 23 in a casing. Hutchins teaches a bellows that is disposed inside the casing that has a magnetically driven motor also in the casing disposed adjacent the bellows. The motor 31 taught by Liotta is outside and apart from the casing. Thus, the context of each of these references are distinct from each other and there is no reason to think that their respective teachings that are applicable specifically to their context can be applied to any other context.

In addition, the Examiner cannot use hindsight to arrive at applicant's claimed invention. Here, the Examiner is using hindsight from applicant's claims. The Examiner is using the elements of the claims of applicant as a road map to find the different elements in

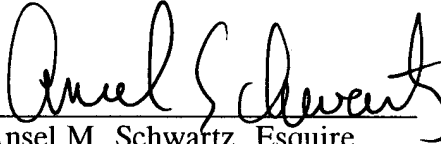
different references of the applied art of record, and having found the different elements in the different references, concludes that applicant's claimed invention is arrived at. This is not patent law. In fact, this is the only motivation to combine the three references that the Examiner has cited. Each reference is totally distinct from the others in terms of specific operations. There is no reason why one skilled in the art would pick and choose the various teachings that the Examiner has found in the references, especially in the context each to the teachings are found. Accordingly, Claim 2 is patentable over the applied art of record. Claims 3 and 9 are also patentable over the applied art of record for the same reasons that Claim 2 is patentable.

The Examiner has rejected Claim 13 as being unpatentable over Liotta in view of Trumble and Hutchins and Norin. Applicant respectfully traverses this rejection. As explained above, the references of Liotta, Trumble and Hutchins cannot make applicant's claimed invention obvious. The additional reference of Norin is non-analogous art which has nothing at all to do with a muscle energy converter, let alone the pumping of blood in any way. It is simply a roller wedge riveter. The Examiner cannot apply non-analogous art. Applicant does not claim to have invented the ability to convert vertical reciprocal movement to horizontal reciprocal movement. However, applicant does claim to use this feature and the context of a muscle energy converter. Nowhere does the applied art of record teach or suggest the same. Accordingly, Claim 13 is patentable over the applied art of record.

In view of the foregoing remarks, it is respectfully requested that the outstanding rejections and objections to this application be reconsidered and withdrawn, and Claims 1-15, now in this application be allowed.

Respectfully submitted,

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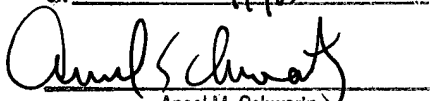
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